

REMARKS/ARGUMENTS

The arguments and amendments submitted herein incorporate the patentability arguments and amendments Applicants discussed with the Examiner during the phone interview on December 14, 2006. Applicants submit that the arguments and amendments presented herein make the substance of the phone interview of record to comply with 37 CFR 1.133. During the interview, the Examiner said he would reconsider the rejection in view of the discussed amendments and arguments.

1. Claims 1-3, 6-9, 10-12, 15-18, 19-21, 23-25, and 28-31 are Patentable Over the Cited Art

The Examiner rejected claims 1-3, 6-12, 15-21, 23-25, and 28-31 as anticipated (35 U.S.C. §102(b)) by Lawrence (U.S. Patent No. 6,253,300). Applicants traverse for the following reasons.

Amended claims 1, 10, 19, and 23 require: receiving an I/O request to update an object in storage; defragmenting the object in storage so that blocks in storage including the object are contiguous in response to receiving the I/O request to update the object, wherein the request to update the object causes the defragmentation operation; and executing the I/O request to update the object in storage.

Applicants amended these claims to recite that the I/O request is to update the object. This added requirement is disclosed on at least pg. 5, para. [0016] of the Specification. The claims were further amended to recite that the request to update the object causes the defragmentation operation. This added requirement is disclosed in at least FIG. 2 and para. [0011], pgs. 2-3 of the Specification.

The Examiner cited col. 5, lines 37-42 of Lawrence as teaching the claim requirement of defragmenting the object in storage so that blocks in storage including the object are contiguous in response to receiving the I/O request. (Final Office Action, pgs. 2-3)

The cited col. 5 mentions that each file is stored in several locations separated by regions of the storage medium that do not hold the file's contents and that fragmentation can be alleviated or eliminated by running a defragmentation program on the files before copying them.

Nowhere does this cited col. 5 anywhere disclose the claim requirement that an I/O request to update an object causes defragmentation of the object. Instead, the cited col. 5

mentions that a defragmentation program can be run on files before copying them. Although one may run a defragmentation program at any time, after or before copying or updating data, the cited col. 5 still does not disclose defragmenting an object in response to receiving an I/O request to update the object to which the defragmentation is directed. Applicants submit that defragmentation files before copying the files does not disclose performing a defragmentation of an object in response to an I/O request to update the object.

In the Response to Arguments, the Examiner further cited col. 6, lines 11-19 and 33-44 and the copy request of Lawrence with respect to the preamended claims. (Final Office Action, pgs. 7-8) Applicants traverse with respect to the amended claims.

The cited col. 6 mentions steps a user may perform, such as deleting files from partition S1 to create S1' on the source disk, defragments S1' to create defragmented S1'', then shrinks S1'' to S1''', and then expands S2 partition to S2' and copies S1''' to S2'. The cited col. 6 mentions performing the file deletion, defragmentation, and partition resizing on-the-fly with imaging. The cited col. 6 discusses performing a defragmentation when deleting files. Nowhere does this cited col. 6 disclose the claim requirement of performing a defragmentation of an object in response to an I/O request to update the object.

Accordingly, claims 1, 10, 19, and 23 are patentable over the cited art because the cited Lawrence does not disclose all the claim requirements.

Claims 2, 3, 6-9, 11, 15-18, 20, 21, 24, 25, and 28-31 are patentable over the cited art because they depend from one of claims 1, 10, 19, and 23, which are patentable over the cited art for the reasons discussed above. Moreover, the following of these dependent claims provide additional grounds of patentability over the cited art.

Claims 3, 12, 20, and 25 depend from claims 1, 10, and 23 and further require determining whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold in response to receiving the I/O request, wherein the object is defragmented if the amount of fragmentation exceeds the fragmentation threshold, wherein the I/O request is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold.

Applicants amended these claims to add the requirement that the I/O request is executed without defragmenting the object in response to determining that the amount of fragmentation

does not exceed the fragmentation threshold. This added requirement is disclosed at block 106 in FIG. 2 and para. [0012], pg. 4.

The Examiner cited col. 5, lines 37-39 as disclosing the additional requirements of these claims. (Final Office Action, pg. 3) Applicants traverse.

The cited col. 5 mentions that fragmentation can be eliminated or alleviated by running a defragmentation program on the files before copying them. Nowhere does this cited col. 5 anywhere disclose determining whether an amount of fragmentation of an object exceeds a threshold in response to receiving a request to update an object. Instead, the cited col. 5 mentions that one may run the defragmentation program to alleviate or eliminate fragmentation before copying files.

Further, nowhere does the cited col. 5 disclose the added claim requirement that the I/O request is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold.

Accordingly, amended claims 3, 12, 20, and 25 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence.

Claims 6, 15, and 28 depend from claims 1, 10, and 23 and further require determining at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition and the I/O request to update the object is executed without defragmenting the object in response to determining that the object is included in more than one logical partition.

Applicants amended these claims to add the requirement that the I/O request to update the object is executed without defragmenting the object in response to determining that the object is included in more than one logical partition. This added requirement is disclosed at block 108 in FIG. 2 and para. [0013], pg. 4.

The Examiner cited col. 5, lines 37-40 of Lawrence as disclosing the additional requirements of these claims. (Final Office Action, pg. 4) Applicants traverse.

The cited col. 5 mentions that fragmentation can be eliminated or alleviated by running a defragmentation program on the files before copying them.

Nowhere does the cited col. 5 anywhere disclose or mention defragmenting the object to update in response to determining that the object is included within one logical partition.

The Examiner referenced the statement at line 40 of “a directory for each file”. This cited statement mentions that there is a need to revisit a directory even if every file in the directory is defragmented. Nowhere is there any disclosure or mention in the cited col. 5 of the specific claim requirement of determining at least one logical partition including the object subject to the I/O request to update the object and then defragmenting if the object is within one logical partition.

Moreover, the Examiner has not cited any part of Lawrence that discloses the added claim requirement that the I/O request to update the object is executed without defragmenting the object in response to determining that the object is included in more than one logical partition.

Accordingly, amended claims 6, 15, and 28 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence.

Amended claims 7, 16, and 29 depend from claims 1, 10, and 23 and further require determining whether the object is read-only, wherein the object is defragmented if the object is not read-only and that the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only.

Applicants amended these claims to add the requirement that the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only. This added requirement is disclosed at block 110 in FIG. 2 and para. [0014], pg. 4.

The Examiner found that it was inherent that defragmentation is only performed for “not-write protected” objects because defragmentation involves copying/deleting an object to a different location. (Final Office Action, pg. 4) Applicants traverse.

Applicants submit that the Examiner has not shown where Lawrence discloses that defragmentation is not performed with respect to a read-only object to update or the added claim requirement that the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only.

Applicants further traverse the Examiner’s “inherency” finding. According to the Manual of Patent Examination and Procedure (MPEP), the “fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” MPEP Sec. 2112, pg. 57 (Aug. 2005, Rev. 3). Applicants submit that it is not “inherent” that write protection overrides defragmentation because the

software designer may make that design choice in designing the defragmentation program. Applicants submit that the Examiner has not cited any art that shows that one cannot design a system so that defragmentation overrides a “read only” attribute for a file.

Accordingly, amended claims 7, 16, and 29 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence.

Amended claims 8, 17, and 30 depend from claims 1, 10, and 23 and further require operations of receiving the I/O request, initiating the operation to defragment the object, and executing the I/O request of defragmenting the object in storage are performed by a storage controller managing I/O requests to the storage.

Applicants amended these claims to correct a minor grammatical error.

The Examiner found that that Lawrence discloses this requirement because the defragmentation occurs in a computer and the computer inherently includes a storage controller and device driver. (Final Office Action, pg. 4) Applicants traverse because there is nothing inherent that defragmentation be initiated by the storage controller as opposed to some program running in the computer. As discussed, the “fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” Thus, the fact that defragmentation “may” be initiated in the storage controller as opposed to a program in the computer makes this finding of inherency inappropriate.

Applicants submit that the Examiner has not cited any part of Lawrence that discloses that the storage controller initiates defragmentation in response to the I/O request. Thus, claims 8, 17, and 30 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence.

Claims 9, 18, and 31 depend from claims 1, 10, and 23 and further require that the operation of defragmenting the object in storage is performed by a device driver for the storage providing an interface to the storage.

Applicants amended claim 31 to depend from claim 23.

As with claims 8, 17, and 30, the Examiner’s finding of inherency is inappropriate because there can be no inherency because the defragmentation may be performed by application programs or other components. Thus, it is not inherent that a device driver perform the defragmentation.

Applicants submit, the Examiner has not cited any part of Lawrence that discloses that a device driver performs the operation of defragmentation. Thus, claims 9, 18, and 31 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence.

2. Claim 22 is Patentable Over the Cited Art

The Examiner rejected claim 22 as obvious (35 U.S.C. §103(a)) as obvious over Lawrence in view of Karger (U.S. Patent No. 5,339,449). (Final Office Action, pg. 5)

Applicants submit that claim 22 is patentable over the cited art because it depends from claim 19, which is patentable over the cited art for the reasons discussed above.

3. Claims 4, 5, 13, 14, 26, and 27 are Patentable Over the Cited Art

The Examiner rejected claims 4, 5, 13, 14, 26, and 27 as obvious over Lawrence in view of Dougliis (U.S. Patent Pub. No. 2005/018075). (Final Office Action, pgs. 6-7) Applicants traverse.

Applicants submit that these claims are patentable over the cited art because they depend from one of claims 1, 10, and 23, which are patentable over the cited art for the reasons discussed above. Moreover, the below discussed dependent claims provide additional grounds of patentability over the cited art for the following reasons.

Claims 4, 13, and 26 depend from claims 1, 10, and 23, respectively, and further require determining whether a user settable flag indicates to perform defragmentation in response to receiving the I/O request, wherein the object is defragmented if the flag indicates to perform defragmentation.

The Examiner cited para. [0032] of Dougliis as teaching the additional requirements of these claims. (Final Office Action, pg. 7)

The cited para. [0032] discusses a power-aware monitor that monitors applications to defer execution of non-critical background tasks, that may be daemons or other application and whose execution is desirable only when there is not a restriction on power usage. Examples include full disk virus scans and defragmentation, among others.

Although the cited para. [0032] discusses a power monitor deferring defragmentation to execute when there is no restriction on power usage, nowhere does the cited para. [0032]

anywhere teach or suggest a user settable flag that indicates to perform defragmentation in response to receiving the I/O request, which is to update the object. Instead, the cited para. [0032] discusses deferring defragmentation for power management concerns, not indicating whether to perform a defragmentation in response to an I/O request as claimed.

Accordingly, claims 4, 13, and 26 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Lawrence or Douglass.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-31 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 50-0585.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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